



ALiSEA

AGROECOLOGY LEARNING ALLIANCE
IN SOUTH EAST ASIA



ONLINE THEMATIC WORKSHOP

"Agroforestry toward Agroecology in Cambodia"

Integrated Agriculture & forestry (~ Agroforestry) Practice for Local Livelihood Improvement

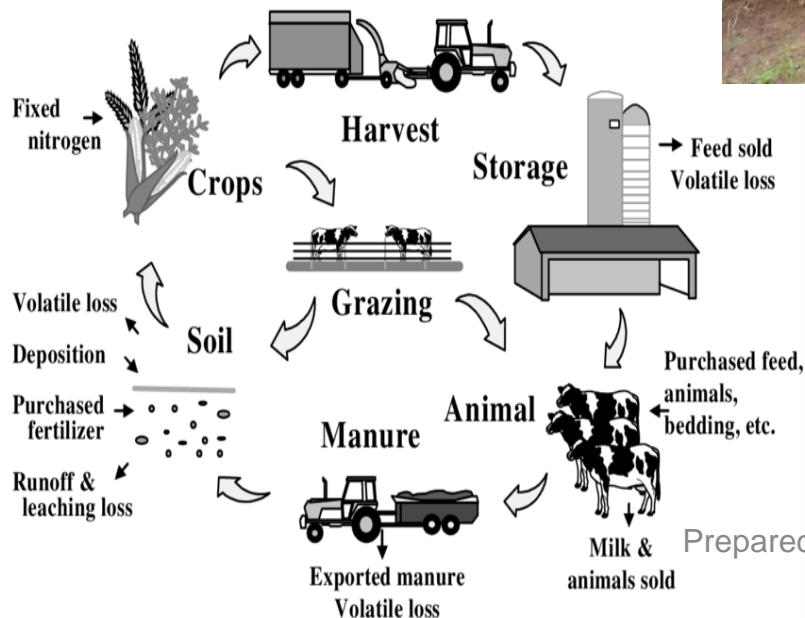


Prepared by: Assoc. Prof. **Von Monin** MAFF's Advisor

28 Mar 2025,

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Integrate Agriculture & Forestry



Integrate Agriculture & Forestry ≈ Agroforestry



= Agronomy



❑ **General Meaning of Integrated/Mixed Agriculture**

The Integrated Agriculture Simultaneous Practice of Planting and Raising more than one species, such as:

- ✓ Cultivation: Safe vegetable cultivation, lemon cultivation, cauliflower planting techniques, onion planting, pest control, crop destruction, pumpkin cultivation
- ✓ Raising animals: Raising pigs, chickens, ducks, geese, cows, sheep, goats

The Integrated Agriculture: a method of Integrated Agriculture in which one farm has more than one purpose, usually growing crops as well as raising animals: It was argued that mixed farming would eliminate agricultural instability and enrich the towns.

The Integrated Agriculture is defined as a complex interrelated matrix of soil, plants ,animals, implements, power, labor, capital and other inputs controlled in part by farming families and influenced to varying degrees by political, economic, institutional and social forces that operate at many levels (Dixon et al., 2001).





❑ The Purpose of Applying Integrated Agriculture

- Provide better family life through vegetables, fruits, meat.
- Increase employment and livelihood and family income.
- As a cover, increase soil fertility, reduce soil damage by sun exposure.
- Helps protect crops from the complete loss of pests and diseases.
- Increase green manure, food crops, help to fertilize the soil (nitrogen).
- Use sunlight and plant foods and maintain soil quality and fertility by protect soil against erosion.

❑ Be careful

- Choose crops carefully by challenging water and light
- New, high-yielding varieties cannot grow with other crops.
- Leaving the soil without cover for a long time (sun heat destroys the soil).

Observations of Some Integrated Agriculture Practices in Cambodia

➤ Agricultural Crops

- Cereals: rice, beans / sesame seeds, corn, peppers.
- Vegetables: cabbage, watermelon, cucumber, tomato, pepper, potato, papaya.
- Fruit trees: Cashews, Jackfruits, Oranges, Local fruits.



Animal husbandry

- Type of Rearing Family Raising: Chicken, Duck, Pig, Sheep, Cattle, Horse Small farms: chickens, / Cattle
- Breeding Place Forage or Pasture near and around the village or house In and around the forest



□ Planting trees

Types of Tree

- Wood Fodder: Neem tree, *Moringa* (Mrum) *Euphorbiaceae* (Ngup)
- Fast-growing: *Acacia*, Coconut, Palm tree, *Cassia siamensis* Lam.
- Local trees: *Azadirachta* (Beng), *Pterocarpus* (Thnong), *Dalbergia* (Neang Nuon), *Dipterocarpus*, (Chheu Teal)



□ Traditional Agriculture

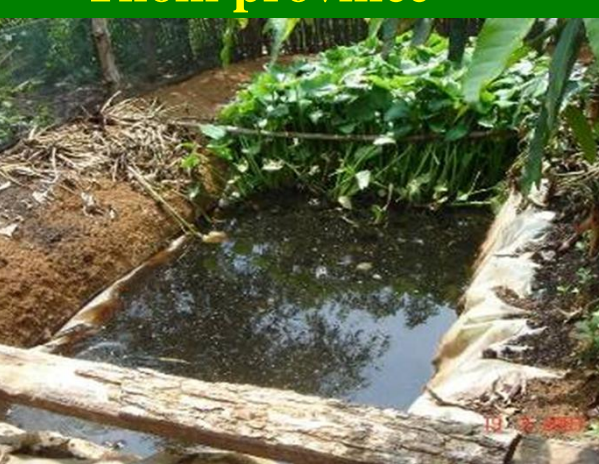
Palm trees growth in the rice fields, can give benefit both to the famers.



❑ Traditional agriculture through Shifting cultivation in Mondulkiri province



❑ Traditional agriculture through fish farming in forested areas in Kampong Thom province



❑ Traditional agriculture through animal husbandry in plantations in Preah Vihear province



❑ .. On the way from Kratie to Siem Reap

- Alternate crops (alley cropping) of corn and rubber tree.



- Integrated farming aims to sustain agriculture and Mixed crops of fruit trees and seasonal crops.



Practice of model Integrated Agriculture Model (Kampot)



Development of Rattan for CPA in Kampot Province



Vegetable providing opportunity for CF in Prea Vihear province



❑ Experience of Alleycropping in Takeo and Kampong Chhnang , by GERES

- *Acacia mangium* (Ang Kanh)
- *Gliricidia sepium* (Khtum tes/ Kathom thet)
- *Pithecellobium* (Ampil Teuk)



❑ Integrated Agriculture Experience in Siem Reap by GERES Harvest (Helping rural Vulnerabilities and Ecosystem Stability)



❑ Integrated Agriculture in Kratie province by **IFRD**



ទំនៀមទម្លាប់ គណៈកម្មាធិការ
គម្រោងអភិវឌ្ឍន៍គណៈកម្មាធិការ ដើម្បីបង្កើនជីវភាព
និងការគ្រប់គ្រងធនធានដោយចីរភាព
រូបិកន្ត យ៉កន្ត គ្រូបង្រៀន រដ្ឋាករ
អនុវត្តដោយ វិទ្យាស្ថានស្រាវជ្រាវ និងអភិវឌ្ឍន៍មូលដ្ឋាន-សង្គម
ឧបត្ថម្ភដោយ : DANIDA ឆ្នាំ ២០១០



❑ Observing with Target Projects of UNDP/SGP

- Integrated Agriculture as Home Garden in Preh Vihea province ($\approx 18\%$)



■ **Integrated Agriculture as Alley cropping in Ratanakiri Province (≈ 12 %)**



▪ **Integrated Agriculture as Rice field with remaining Resin Tree in Pursat ($\approx 45\%$)**



■ **Integrated Agriculture as Living fence in Takeo province ($\approx 10\%$)**



- **IA Animal feeding in forest area in Kampong Thom province ($\approx 15\%$)**



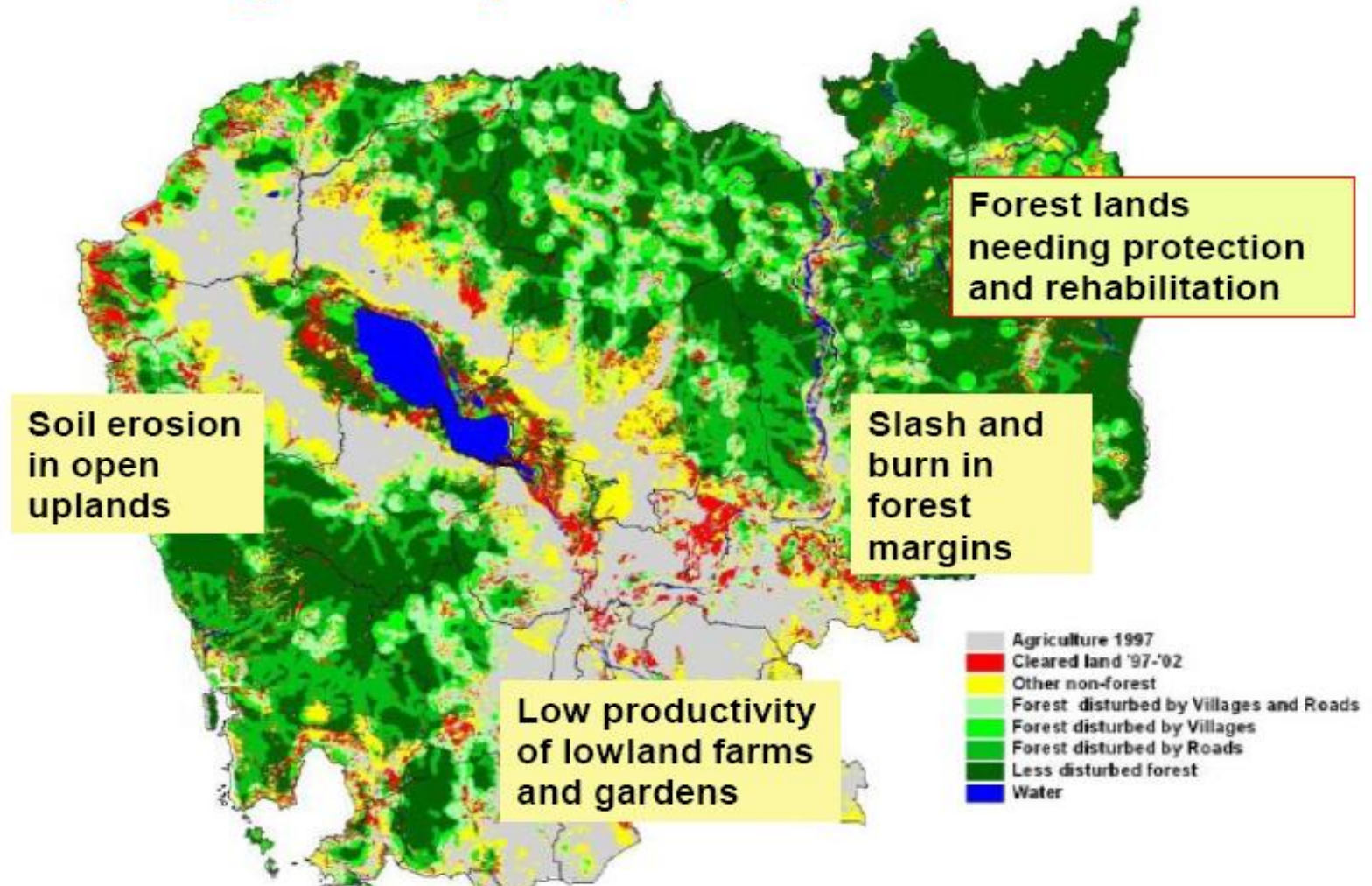
■ Fruit tree plantations in the watershed area in Trengtrâyeung Commune K.Sp province (of Mr. Nuon Bunthoeun family)"



- Prepare the terracing.
- Mixed Fruit tree planting: Jackfruit, Coconut tree, Banana, Duren, Vegetable..ect selling production.
- Promote for Agroforest tourism
- Deciduous forest at the top mountainous area

□ Integrated Agriculture that can address the challenges of Cambodia's in changing the natural landscape.

Where can agroforestry help in Cambodia ?



➤ The Simple Practices in the process of Organizing IA

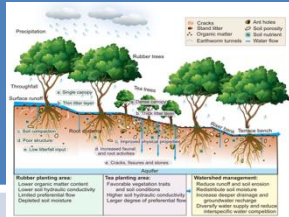
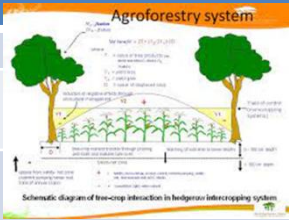
- Prepare detailed project objectives
- Choose a place or locations
- Boundaries or designs
- Tree and crop species or animal selection
- Planting site preparation
- Planting trees and crops (Detailed planning of trees and crops)
- Inspection and control.



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➤ Characteristics of IAS requirements for Biodiversity Conservation

Activities	Variable	Desirable characteristics
Design of IA System	Species composition	Diverse species composition, mixture of early, mid and late successional species, preferably native species;
	Tree/Shrub density	Higher tree/shrub density leads to greater biodiversity;
	Type of IA system	As long as it is floristically and structurally diverse
Management IA System	Management regime	Minimal management, the strategies should maximize habitat availability of diverse resources for wildlife;
	Soil management	Minimal;
	Harvesting of products	Minimal harvesting that emulates natural disturbance;
	Fire management	Should follow natural fire regimes to the extent possible;
Spatial Configuration	Management of snags and coarse woody debris	Maintain snags and coarse woody debris as habitat for certain species.
	Location within broader landscape	Enhance landscape connectivity, functionally linking habitat fragments; Adjacent to PAs, riparian corridors & native habitat;
	Types of land	Degraded sites, where revegetation through AF will have a beneficial impact on biodiversity.





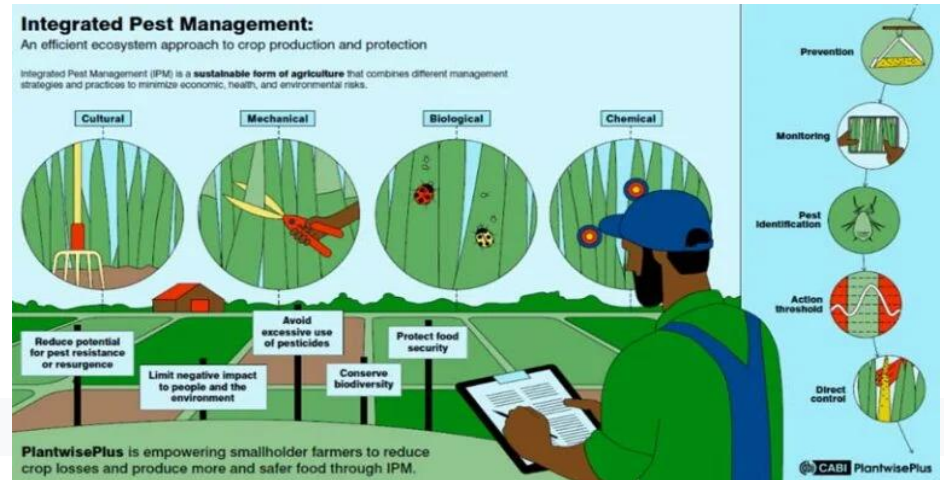
Key findings on observations of Integrated Agriculture

- They have poorly cultivated farmland and are often in waterlogged conditions during the rainy season, the dry season, and prolonged drought.
- They planted fruit trees and also a few hardwoods that cost less because of accidental interventions without good planting patterns or arrangements.
- Planting different types of trees does not have a clear purpose regarding structure and function.
- Focus heavily on short-lived trees & crops, applied aquaculture in the system, because their land comprise water & forage throughout the year.
- They lack knowledge in the exact matching of suitable crops and soil properties and do not know much about different integrated agriculture .
- They have little knowledge and experience in producing seedlings and planting other fruit trees, which is not a common problem for them.
- Most of these farmers are subsistence and have other sources of income, most of which are land under tenure or state land.



Common Risks in Choosing to practice of Integrated Agriculture

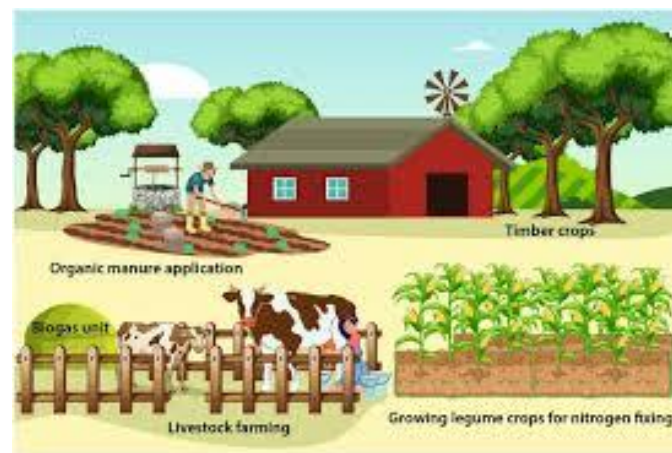
- The combination of animal husbandry or planting sometimes does not match the topography and soil type.
- There is no market demand study before choosing what kind of crop to choose other than regular food for home use.
- Not using the value-added input test process.
- Disrespect or value other goods and services that can be obtained from agricultural practices.
- Failing to link agricultural work with the latest high-quality market demand, such as for tourism and green product certification to meet international trade standards.





Is there anything to interpret in Integrated Agriculture Practice?

- The overall purpose is to provide general guidelines for agricultural practitioners, recruiters, planners and promoters.
- In particular, it seeks guidance to farmers about their options in relation to: How to select the type of Integrated Agriculture suitable for a given location (location) along the continuous landscape?
- How to design an Integrated Agriculture with a suitable crop combination according to soil, climate, geographical location and function?
- How to integrate agro-industry with food production, biodiversity conservation, natural park development and ecotourism.



Project Activities.....in Some Countries in Lower Mekong

❶ Project of Forest Research Development Institute (FA), Cambodia

➤ Objectives

- Compile and introduce the new technology which is resistance to the climate change and effective economy
- Enhance the practice of Agro-ecological via reduce the chemical fertilizers and pesticides in order to improve the safety, healthy, environment, and society.
- Illegible to control the risk such as pest, deceases, and weed via natural cropping system management
- Enhance the production group, agricultural cooperative, contracted farming base on market demand.



Figure of Integrated Agriculture

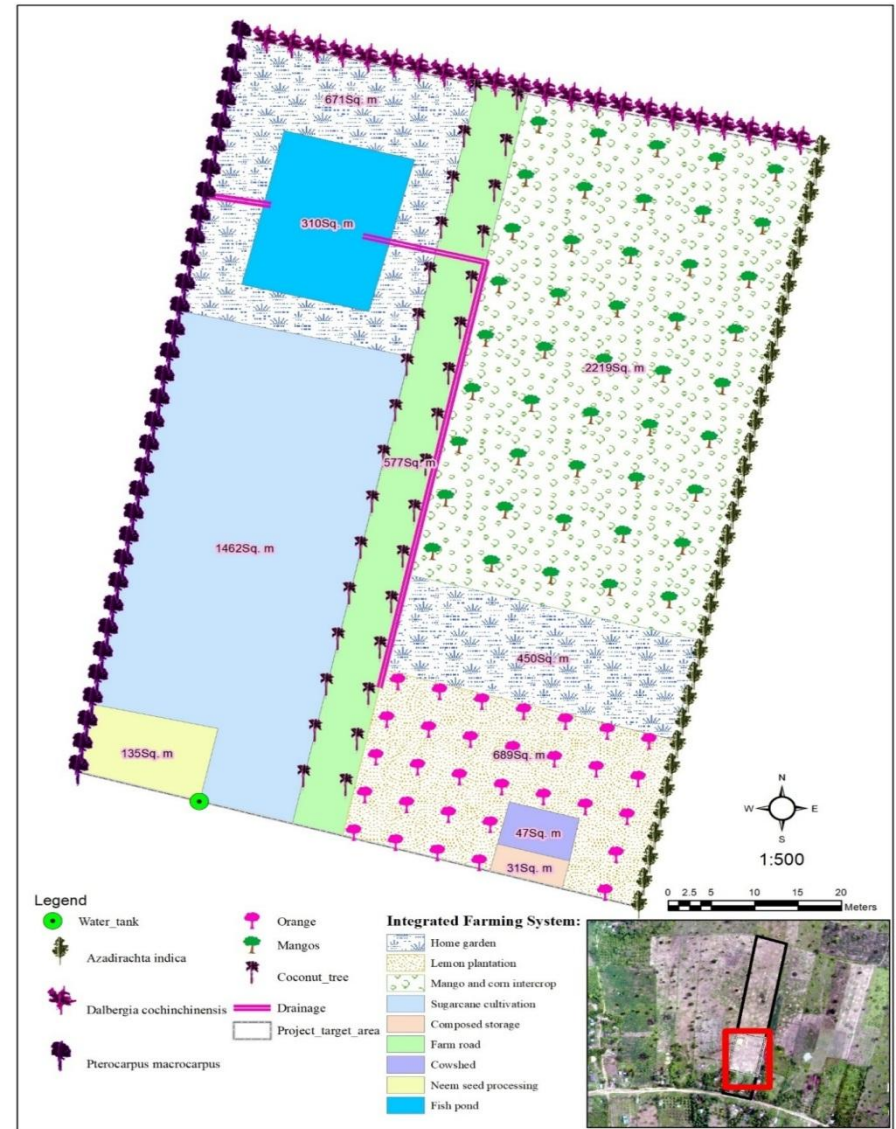
➤ Criteria for Implementation

- Land size min. 0.4 ha at least. Farming layout should be consisted of water-source, rice field, fruit tree, vegetable, and animal raising spot.
- Secure the water, set up the irrigation system
- Labor and budget: 2 labor at least/household
- Active/good farmer and well-trained on IA



➤ Need to pay attention on:

- Resources (budget, water, seed, fertilizer) labors, and techniques.
- Weather condition in the area.
- Seasoning crop, market demand, price, and income
- Management and solution on risk occurred during the production process.





Pineapple with mango tree



Peanut with cashew nut



Eggplant with lemon



Green bean with orange



② Lao PDR

“Soil, water & nutrient management in drought Zones”

- Population of Lao PDR about 7.5 million
- More than 70% based on agriculture
- About 4.5 million ha of land area for agriculture
- Poor soil and water scarcity are the major issues for agriculture in the Laos particular in the drought zones.

Activities:

- **Improvement the water quality in the Pond**



- Technical support to fertilizer application



- Vegetable and sweet corn plantation in dry season.



- Model farmers in project area



③ Vietnam

(Implemented by Research Institute for Forest Ecology and Environment – Vietnamese Academy of Forest Sciences)

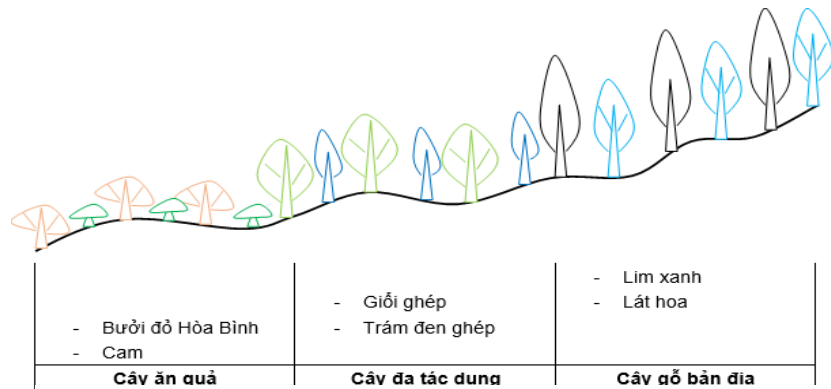
Objectives:

- To improve seed sources and seedling production and management,
- To establish demonstration models of forest rehabilitation & management.
- To study the impact of forest rehabilitation on soil, water and biodiversity in project areas, Hoa Binh, Vietnam

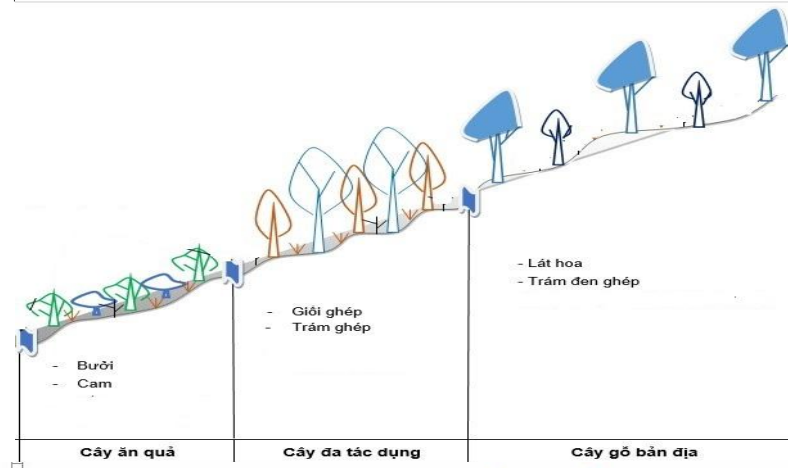
Main focus

- Training and capacity buildings
- Establishment of plant tissue culture lab and its operation
- Establishment and maintenance of demonstration models for Forest Restorations, CFM and Agro-Forestry
- Study the impact of forest rehabilitation on soil, water and biodiversity in project areas

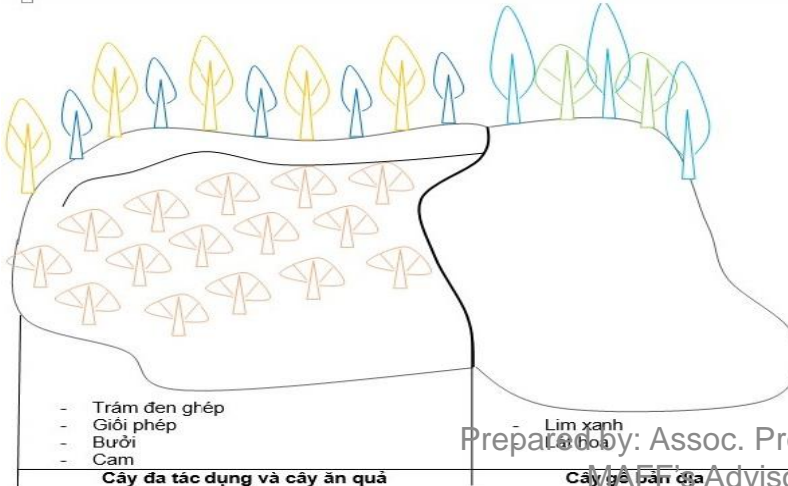
Design, establishment and maintenance of A-F model



A-F Model 3: 1.6 ha, in Cú village, Tử Nê commune, Tân Lạc district, Hoa Binh



A-F Model 2: 2.4 ha, in Nam Phong commune, Cao Phong district, Hoa Binh



A-F Model 1: 1.0 ha, in Tay Phong commune, Cao Phong district, Hoa Binh

Design, establishment and maintenance of enrichment planting model



01 ha medicinal planting model under CFM forest canopy



Participatory forest inventory for impact assessment



④ Lao_Hilly Land Agroforestry and Soil management in Laos

The project also aims to integrate complementary crops or forage/ livestock into more diverse farming systems that can maintain profitability with lower levels of erosion and loss of soil fertility

Organic Farming Orientation

- ❖ Definition
- ❖ Principles
- ❖ Relevance of Organic Farming to the Project
- ❖ Alignment with Organic Farming Principles





Main Activities

1. Research and Demo on soil improvement
2. Village revolving fund
3. Fruit tree plantation
4. Forage cultivation
5. Terrace cultivation (2022)



The Summary

of Integrated Agriculture System/ Agroforestry

& What is Agroforestry?

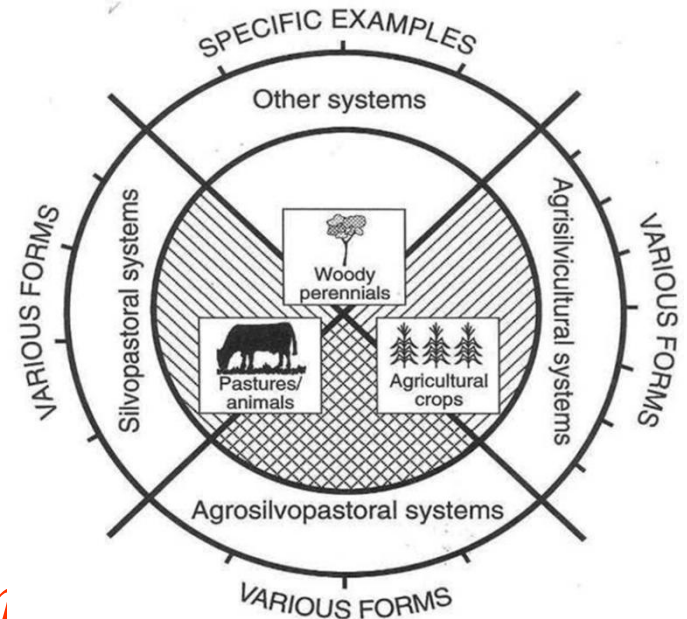
➤ **The Definition of Agro-Forestry**

- A new name for the work of cultivating crops using old agricultural practices.
- A system of land use that is agricultural, perennial,
- Uses integrated technologies, with trees/fruit trees, crops, and livestock.
- Crops are intentionally combined on the same managed area.
- There are ecological and economic interactions among the different components.
- Planted with a clear purpose and in the form of a planned or ordered scale



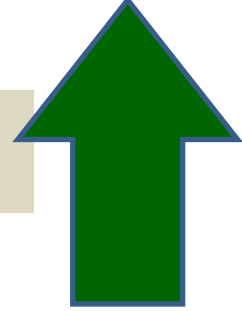
ចំណាត់ថ្នាក់ប្រព័ន្ធកសិ រុក្ខកម្ម

- Agri silvicultural
(*Crops & trees*)
- Silvopastoral
(*Trees & pasture/animal*)
- Agro silvopastoral
(*Crops trees & pasture/animal...*),



- Other Agroforestry systems, mixed with other production systems

Mixed farming/Agroforestry Systems



Reduce Pressure on Forests



Climate Change Impacts



**Crops Work,
Income, Land
Protection Non-
Migration**

Success Factors

Human Behavior
(Human habits)

HUMAN

Creativity
(Study Regularly)

Optimistic
(Have a credible plan)

បែបបទ/របៀបនៃការអនុវត្ត នៅក្នុងប្រព័ន្ធកសិរុក្ខកម្ម

Procedures/methods of implementation in agroforestry systems



Field Guide to
Agroforestry Practice
Along the Landscape
Continuum in Cambodia

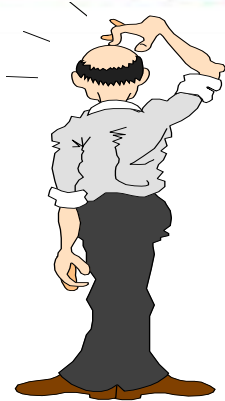
Phnom Penh, November 2012/IRD/FA/MAFF

Prepared by: Assoc. Prof. Von Monin
MAFF's Advisor 50

បែបបទនៃការអនុវត្តកសិវត្ថុកម្ម (Agroforestry practices)

- 1) កែលំអដីទំនេរ (*Improve fallow*)
- 2) តុនហ្ស៊ីយ៉ា (*Taungya*)
- 3) ដាំដំណាំជាជួរឆ្នាស់ (*Alley cropping*)
- 4) សួនឫចំការដំណាំរុក្ខជាតិឈើច្រើនស្រទាប់ (*Multilayer Tree garden*)
- 5) ការដាំឈើក្នុងដីអភិរក្សនិងដីដែលបានរាន (*Tree in soil conservation & reclamation*)
- 6) គេហសួន/សួនដំណាំក្បែរផ្ទះ (*Home gardens*)
- 7) របាំងការពារខ្យល់និងជំរក (*Wind break & Shelter belts*)
- 8) ដាំដើមឈើសំរាប់ផលិតកម្មអុស (*Tree for wood production*)
- 9) ការដាំ-ថែទាំឈើលើទីវាលឬវាលស្មៅ (*Tree on range land or pastures*)
- 10) ការដាំឈើចំណីសត្វដែលសំបូរប្រូតេអ៊ីន (*Protein bank*)
- 11) ចំការដំណាំ-រក្សាស្មៅស្រទាប់ក្រោមដើមឈើលែងសត្វ (*Plantation crops with pastures & Animals*)
- 12) ការចិញ្ចឹមឃ្មុំនៅនឹងដើមឈើ I (*Apiculture Bee with trees*)
- 13) មច្ចុ-វត្ថុវប្បកម្ម (*Aquaforetry*)
- 14) កសិកម្មពនេចរ (*Shifting cultivation*)
- 15) ប្រព័ន្ធដំណាំឆ្នាស់ជួរចន្លោះរបាំងធម្មជាតិ(ដើមឈើ) (*Hedgerow intercropping system*)
- 16) ដើមឈើតាមបណ្តោយព្រំចំការ (*Trees Along Farm Boundaries*)
- 17) ដាំដើមឈើធ្វើជាទ្រើងរស់សំរាប់ដំណាំវល្លិ (*Trees as Live Trellis*)
- 18) ប្រព័ន្ធចិញ្ចឹមសត្វក្រោមដើមឈើនិងដំណាំ (*Tree-Crop Grazing System*)
- 19) ប្រព័ន្ធការពាររបងរស់ (*Living fence System*)
- 20) សួនឫចំការដំណាំរុក្ខជាតិឈើចំរុះ-ពហុប្រយោជន៍ _ (*Multipurpose tree gardens*)
- 21) ចំការដំណាំប្រមូលផ្តុំចំរុះ (*Plantation crop combination*)
- 22)

Analysis of Integrated Agriculture functions



Ecology function

Socio-economic
Function

Sustainable
Implementing

- Sustainable Agriculture

- Sustainable Forestry

- Sustainable Land Used

តើអ្នកគិតថាការអនុវត្តកសិកម្មចម្រុះសមស្រប
អាចជួយលើកកម្ពស់ជីវភាពប្រជាពលរដ្ឋ
ជនបទដែរទេ ?



អគុណ ចំពោះការយកចិត្តទុកដាក់ស្តាប់ !!!